

GUIDELINE TO USING SOIL AND GROUNDWATER CONTAMINANT PLATES

The intent of the plates is to present soil and groundwater data and interpretive contours that represent soil and groundwater conditions.

5701

Soil Plates

Based on soil samples collected at the FEMP, soil isoconcentration plates were created for each parameter by sampling depth interval. In reviewing the plates, the reader should understand how the lack of data at specific depths may affect the isoconcentration plates. For instance, a contour may appear on the 0- 0.5-foot plate of a given parameter. However, in the 0.5- to 1.0-foot interval, no samples may have been collected. If samples were subsequently collected in the 1.0- to 1.5-foot sampling interval and contamination was detected, the contour line would reappear. In such cases, interpolation of the data would suggest that contamination exists in the intermediate level, although no data were collected to verify its presence.

Pertinent points regarding surface and subsurface soil plates:

- Surface and subsurface soil plates show all soil data lying inside other OU boundaries. However, typically contours stop at the edges of waste units, and concentration contours are not portrayed inside the geographic boundaries of waste units. The exception to this is found on some of the total uranium plates, where total uranium was contoured within Operable Unit 2 waste subunits.
- Contours were generated by hand in order to best portray estimated areas of contamination. Solid line contours indicate specific parameter contamination areas. For comparative purposes, each plate also has a 20 ug/kg dashed contour indicating the approximate extent of total uranium contamination corresponding to the 10^{-5} risk level (uranium envelope concept). This contour includes background.
- The maximum result was selected from each sampling location by depth for mapping. The selection criteria was as follows: Select the maximum concentration from '-' qualified data; if no '-' qualified data was available, then the maximum J qualified datum was selected; if no J qualified data was available, then the maximum UJ qualified datum was selected; etc,... where the relative preferences of data were ranked '-' > J > UJ > U > UNV > NV > R > Z.
- The plates portray concentrations and data qualifiers for each sampling location by depth. Appendix T contains tabulated data files for each plate. For reference, each table lists the sample number and date of collection for individual data presented on each plate.
- Several radiological parameters have both a validated and nonvalidated plate. Due to the large number of samples for some parameters, it was necessary to present data in this manner on the C-size plates so that the plates would be readable. For contouring purposes, data was plotted on E size drawings containing both validated and nonvalidated results. This contour was then transferred to the C-size plates. The same contour is shown on both the validated and nonvalidated plate.

Groundwater Plates

The 1993 sampling programs are the most comprehensive data set constrained to a relatively short period. Consequently, the plates presented in the RI Report are primarily based on the 1993 data set.

Though the 1993 data set is extensive, the 1993 data set does not have a concentration value for every parameter in every well. All wells required a data value in order to present accurate plates and provide contours that accurately describe site conditions. If a well was not sampled during the 1993 data set period, a representative value was selected from the OU5 database by choosing the chronologically most recent maximum value in the database. In some cases this value was a 1994 datum. In most cases the chronologically most recent datum predated the 1993 data set.

Pertinent points regarding the groundwater plates are:

- Type 1 well plates show all Type 1 wells, Type 1 hydropunches and Type 1 lysimeters, with the exception of three deep lysimeters and several wells not depicted on the C-size plates due to space constraints. (see below)
- Three lysimeter locations have paired shallow and deep lysimeters - in these cases, only the shallow lysimeter data is shown; 11130, 11132, 11134 are shown, and 11129, 11131, and 11133 are not shown.
- Well 1728, located in the north-west corner and Well 1733, located in the southeast corner were not contoured. Some of the results on the plates reflect samples taken before purging the wells. This data has since been validated and rejected. The correct data for Wells 1728 and 1733 are listed in Appendix E.
- Type 1 plates show all groundwater and leachate data lying inside other OU boundaries; however, contours stop at the edges of subgrade waste units, and concentration contours are not portrayed inside the geographic boundaries of subgrade waste units for all parameters, except total uranium. Total uranium is contoured in Operable Unit2 waste subunits.
- Type 2, 3 and 4 well plates show only Type 2, 3 and 4 wells, respectively (Type 2, 3 and 4 total uranium data collected by hydropunch are portrayed on cross sections in Section 4.8.1).
- Type 2, 3 and 4 plates show all data lying below other OU boundaries and contours are continuous beneath waste units of other OUs.
- Contours were generated by hand in order to best portray estimated plume shapes in terms of known groundwater flow directions and known or suspected sources.
- Solid line contours indicate specific parameter contamination. Each plate also shows a 5 ug/L and 20 ug/L dashed contour line. The 5 ug/L dashed contour approximates the 10^{-6} risk level for total uranium. The 20 ug/L dashed contour approximates the 10^{-5} risk level for total uranium. Both contour levels include background added to the calculated risk level.
- One datum was selected from each well for mapping - The database was first queried for the maximum 1993 datum; if no 1993 datum was available then other years were successively searched in the following order until a datum was located:

1994, 1992, 1991, 1990, 1989, 1988.

Each datum was selected from a year's data according to the following search criteria:

Select the maximum concentration from '-' qualified data; if no '-' qualified data was available, then the maximum J qualified datum was selected; if no J qualified data was available, then the maximum UJ qualified datum was selected; etc,... where the relative preferences of data were ranked '-' > J > UJ > U > UNV > NV > R > Z.

- The plates distinguish '1993 data' from non-1993 data by showing '1993 data' in parentheses.
- Data were printed as E-size drawings for hand-contouring; subsequently, plates were printed on C-size paper for inclusion in the plate volume.
- Plates of Type 1 data were contoured using data from all wells except:

1178 1180 1181 1183 1185 1188 1190 1194 1196 1199 1202 1203 1204 1205 1221 1227 1231 1233 1250 1780
1781 1783 1784 1785 11099 and 1411

These wells were omitted because of space considerations (could not fit all data on E-size drawings used to contour). However, data from these wells was included in perched groundwater summary statistics.

All deleted wells are within the Plant 2/3 and pilot plant areas where wells are numerous and closely spaced; detail that is potentially not revealed because of this action could not be shown at the scale used for C-size figures in the RI Report.

- Type 3 and 4 well data was plotted on the same plate. Only Type 3 wells were contoured. Type 4 wells were not contoured due to the small number of data points.
- The plates portray concentrations and data qualifiers for each well. Appendix T contains tabulated data files for each plate. For reference, each table lists the sample number and date of collection for individual data presented on each plate. Note that the tables also contain data for the wells that are not shown on each plate (well numbers are listed above).